

Abstract Submitted  
for the MAR11 Meeting of  
The American Physical Society

**Optimizing materials for photon-enhanced thermionic emission**

JARED SCHWEDE, DANIEL RILEY, IGOR BARGATIN, SAMUEL ROSENTHAL, ROGER HOWE, NICHOLAS MELOSH, ZHI-XUN SHEN, Stanford University — We recently described a novel process for solar energy harvesting called photon-enhanced thermionic emission (PETE) based on a semiconductor cathode and a low-workfunction anode separated by a vacuum gap. Previous work explored the limiting theoretical efficiency of a PETE device, which was shown to exceed the Shockley-Queisser limit on single-junction photovoltaic cells, and described experiments that showed strong evidence the PETE effect. In this presentation, I will describe challenges for making the PETE process efficient, some of which were encountered in these proof-of-concept measurements. I will also describe experimental paths to overcoming these challenges and improving efficiency.

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Date submitted: 19 Nov 2010

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